

Patent claims:

1. A silicone-containing polyvinyl acetal obtainable by means of
 - 5 1) copolymerization of
 - a) one or more vinyl esters of straight-chain or branched alkylcarboxylic acids having 1 to 15 C atoms and
 - b) one or more silicone macromers having at least one polymerizable group and
 - 10 2) subsequent hydrolysis of the copolymer to give the silicone-containing polyvinyl alcohol and
 - 3) subsequent acetalation of the silicone-containing polyvinyl alcohol with one or more
 - 15 aldehydes from the group consisting of aliphatic and aromatic aldehydes having 1 to 15 C atoms.
2. The silicone-containing polyvinyl acetal as claimed in claim 1, characterized in that the
 - 20 vinyl esters a) used are one or more from the group consisting of vinyl acetate, vinyl propionate, vinyl butyrate, vinyl 2-ethylhexanoate, vinyl laurate, 1-methylvinyl acetate, vinyl pivalate and vinyl esters of α -
 - 25 branched monocarboxylic acids having 5 to 13 C atoms.
3. The silicone-containing polyvinyl acetal as claimed in claim 1 or 2, characterized in that the
 - 30 silicone macromers b) used are one or more having the general formula
$$R^1_a R_{3-a} SiO(SiRR^1O)_b (SiR_2O)_n SiR_{3-a} R^1_a$$
R being identical or different and being a monovalent, optionally substituted, alkyl radical or alkoxy radical
 - 35 having in each case 1 to 18 C atoms, R^1 being a polymerizable group, a being 0 or 1, b being from 0 to 10 and n being from 3 to 1000, from 85 to 100% by weight of the silicone macromer containing at least one polymerizable group.

4. The silicone-containing polyvinyl acetal as claimed in any of claims 1 to 3, characterized in that alkenyl radicals having 2 to 8 C atoms or mercaptoalkyl groups having 1 to 6 C atoms are present as polymerizable groups R¹.
5. The silicone-containing polyvinyl acetal as claimed in any of claims 1 to 4, characterized in that silicone macromers having a linear or branched structure are used, where R = methyl radical, and where n is from 3 to 1000, which contain one or two terminal, polymerizable groups, or contain one or more polymerizable groups in the chain, or contain one or two terminal polymerizable groups and at least one polymerizable group in the chain.
6. The silicone-containing polyvinyl acetal as claimed in any of claims 1 to 5, characterized in that the silicone macromers used are binary or ternary mixtures of linear or branched polydialkoxysiloxanes without a polymerizable group, with linear or branched polydialkylsiloxanes having one and/or two polymerizable groups.
7. The silicone-containing polyvinyl acetal as claimed in any of claims 1 to 6, characterized in that one or more silicone macromers from the group consisting of α -monovinylpolydimethylsiloxanes, α -mono(3-acryloyloxypropyl)polydimethylsiloxanes, α -mono(acryloyloxymethyl)polydimethylsiloxanes, α -mono(methacryloyloxymethyl)polydimethylsiloxanes, α -mono(3-methacryloyloxypropyl)polydimethylsiloxanes, α,ω -divinylpolydimethylsiloxanes, α,ω -di(3-acryloyloxypropyl)polydimethylsiloxanes, α,ω -di(acryloyloxymethyl)polydimethylsiloxanes, α,ω -di(methacryloyloxymethyl)polydimethylsiloxanes, α,ω -di(3-methacryloyloxypropyl)polydimethyl-

siloxanes, α -mono(3-mercaptopropyl)polydimethylsiloxanes and α,ω -di(3-mercaptopropyl)polydimethylsiloxanes are used.

- 5 8. The silicone-containing polyvinyl acetal as claimed in any of claims 1 to 7, characterized in that butyraldehyde, optionally as a mixture with acetaldehyde, is used for the acetalation.
- 10 9. The silicone-containing polyvinyl acetal as claimed in any of claims 1 to 8, having
15 from 0 to 30% by weight of vinyl ester units,
 from 5 to 95% by weight of vinyl alcohol units,
 from 3 to 94.9% by weight of vinyl acetal units,
 and
 having a silicone content of from 0.1 to 45% by weight, based in each case on the total weight of the silicone-containing polyvinyl acetal, the data
20 in % by weight summing to 100% by weight.
- 20 10. A process for the preparation of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 by means of
 1) copolymerization of
25 a) one or more vinyl esters of straight-chain or branched alkylcarboxylic acids having 1 to 15 C atoms and
 b) one or more silicone macromers having at least one polymerizable group and
30 2) subsequent hydrolysis of the copolymer to give the silicone-containing polyvinyl alcohol and
 3) subsequent acetalation of the silicone-containing polyvinyl alcohol with one or more aldehydes from the group consisting of aliphatic
35 and aromatic aldehydes having 1 to 15 C atoms.
11. The process as claimed in claim 10, characterized in that the copolymerization is effected by mass polymerization, suspension polymerization or

polymerization in organic solvents.

12. The process as claimed in claim 11, characterized in that the copolymerization is effected in a nonaqueous, organic solvent, in the presence of free radical initiators, the nonaqueous solvent used being a mixture of at least two nonaqueous solvents, at least one of which nonaqueous solvents has a transfer constant C_s to vinyl acetate of $C_s > 20 \times 10^{-4}$ at 70°C.
13. The process as claimed in any of claims 10 to 12, characterized in that the hydrolysis is effected to a degree of hydrolysis of from 30 to 100 mol%.
14. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 in printing ink compositions.
15. The use as claimed in claim 14, characterized in that the printing ink composition contains from 5 to 50% by weight of pigments, from 4 to 40% by weight of silicone-containing polyvinyl acetal binder and solvents, and optionally also further additives.
16. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 in laminated safety glass, glass laminates and window films.
17. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as protective colloids for aqueous dispersions, in polymerization in an aqueous medium, and in the preparation of dispersion powders redispersible in water.
18. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as

binders in water-based finishes or in finishes based on organic solvents.

- 5 19. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as binders in corrosion inhibitors.
- 10 20. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as binders for ceramic powders and metal powders.
- 15 21. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as binders for the internal coating of cans.
- 20 22. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 for the coating of wood, metals, glass, plastics and paper.
- 25 23. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as release agents or for the production of release coatings.
- 30 24. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as water repellents and modifiers.
- 35 25. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 in cosmetic formulations.
26. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 for textile coating or for the treatment of textiles.
27. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as an

additive in the building sector for cement-containing and non-cement-containing systems.

- 5 28. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 as an additive for antifoam formulations.
- 10 29. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 in building protection for the production of weathering-resistant coatings or sealants.
- 15 30. The use of the silicone-containing polyvinyl acetals as claimed in any of claims 1 to 9 in the polish sector.